Predictors of Pretreatment Commitment to Abstinence: Results from the COMBINE Study

KELLY S. DeMARTINI, PH.D.,[a,*] ERIC G. DEVINE, PH.D.,[b] CARLO C. DiCLEMENTE, PH.D.,[c] DANIEL J. MARTIN, PH.D.,[a,d] LARA A. RAY, PH.D.,[e,f] AND STEPHANIE S. O'MALLEY, PH.D.[a,g]

[a]*Department of Psychiatry, Yale University School of Medicine, New Haven, Connecticut*

[b]*Boston University School of Medicine, Boston, Massachusetts*

[c]*University of Maryland, Baltimore County, Baltimore, Maryland*

[d]*Martin Research and Consulting, Cambridge, Massachusetts*

[e]*Department of Psychology, University of California Los Angeles, Los Angeles, California*

[f]*Department of Psychiatry and Biobehavioral Sciences Brain Research Institute, University of California Los Angeles, Los Angeles, California*

[g]*Yale Cancer Center, New Haven, Connecticut*

ABSTRACT. Objective: Patients entering treatment for alcohol problems do not have uniform treatment goals, and a pretreatment drinking goal has a significant impact on treatment outcome. The objective of this study was to understand better how an array of individual characteristics, including factors that affect treatment, are related to treatment goals before beginning alcohol treatment in the COMBINE (Combining Medications and Behavioral Interventions) Study. **Method:** Participants were alcohol-dependent individuals ($N = 1,156$; 357 women) recruited at 11 outpatient academic alcoholism-treatment clinics across the United States to participate in a randomized, double-blind, placebo-controlled trial that combined behavioral intervention with acamprosate and/or naltrexone. Treatment goal was coded as controlled drinking, conditional abstinence, or total abstinence. Multinomial logistic regressions assessed whether there were significant relationships between predictor variables and pretreatment goal selection. **Results:** Lower levels of alcohol-related consequences, lower readiness to change, higher family income, more daily drinkers in social network, and lack of prior treatment or Alcoholics Anonymous engagement predicted choice of a controlled drinking goal over a total abstinence goal. Fewer alcohol-related consequences, lower readiness to change, and more daily drinkers in-network predicted choice of a conditional abstinence goal over a total abstinence goal. **Conclusions:** Higher levels of functioning, lower levels of consequences, no prior involvement in treatment and Alcoholics Anonymous, and a more drinking-saturated social environment are associated with the choice of a non-abstinence goal. (*J. Stud. Alcohol Drugs, 75,* 438–446, 2014)

THE DOMINANT MODEL OF ALCOHOL ABUSE and dependence treatment in the United States for nine decades has been the medical model (Jellinek, 1960), in which the treatment goal is total abstinence (TA). Despite this, patients have varying levels of motivation (Ryan et al., 1995), and their treatment goals may be different from abstinence. In the 1970s, Sobell and Sobell (1973) proposed moderate drinking as a viable treatment goal. Since then, there has been controversy about whether treatment facilities should allow moderate, or controlled, drinking as an acceptable goal (see Marlatt et al., 1993; Marlatt and Witkiewitz, 2002; Pettinati et al., 1982; Wallace, 1990). With the advent of pharmacotherapies that reduce heavy drinking episode severity (Pettinati et al., 2006), renewed attention has been directed toward moderation, and the acceptability of non-abstinence goals by substance use disorder professionals has been increasing (Davis and Rosenberg, 2013).

One consideration is understanding how patients' pretreatment goals are related to treatment outcome. For non-abstinence goals to be better incorporated into mainstream alcoholism treatment, their relationship to treatment outcome should be more thoroughly understood. An abstinence goal is the degree to which a patient's treatment goal is total and permanent abstinence versus a less restrictive goal (Hall et al., 1990). In early studies, TA goals predicted better treatment outcome (Hall and Havassy, 1986; Hall et al., 1990, 1991). In one study, only 54% with a TA goal relapsed, whereas 80% who selected a conditional abstinence

Received: July 1, 2013. Revision: October 30, 2013.

Funding for this study was provided by National Institute on Alcohol Abuse and Alcoholism (NIAAA) Grants T32 AA015496-07 (to Kelly S. DeMartini), P50 AA012870, and K05 AA014715 (to Stephanie S. O'Malley) and by the Connecticut Department of Mental Health and Addiction Services. The content is solely the responsibility of the authors and does not necessarily represent the official views of the funding agencies. The authors acknowledge that the reported results are, in whole or in part, based on analyses of the COMBINE data set. These data were collected as part of a multisite clinical trial of alcoholism treatments supported by a series of grants from the NIAAA, National Institutes of Health, and Department of Health and Human Services. This article has not been reviewed or endorsed by NIAAA or the COMBINE Research Group and does not necessarily represent the opinions of its members or NIAAA, who are not responsible for the contents.

*Correspondence may be sent to Kelly S. DeMartini at the Department of Psychiatry, Division of Substance Abuse, Yale University School of Medicine, 1 Long Wharf Drive, Box 18, New Haven, CT 06511, or via email at: kelly.demartini@yale.edu.

(CA; i.e., an abstinence goal that allows for the possibility of future slips) goal relapsed (Hall et al., 1990). Those with TA goals also had a longer time between first use and relapse (Hall and Havassy, 1986; Hall et al., 1990). Other baseline patient characteristics, including coping strategies, were not associated with 6-month outcome (Hall et al., 1991). Overall, TA goals predicted better treatment outcome.

Recent research examined the impact of pretreatment goal on a broader range of treatment outcomes. In a multisite, randomized controlled trial of motivation enhancement therapy (MET; Miller et al., 1994) and Social and Behavioral Network Therapy (Copello et al., 2002), patients who selected a TA goal had a greater frequency of abstinent days at 3 and 12 months posttreatment than those selecting a nonabstinence goal (Adamson et al., 2010). There was no effect on dependence severity or drinks per drinking day (DPDD; Adamson et al., 2010). Therefore, when participants drank, pretreatment goal did not predict quantity, but it was related to the number of days on which they drank.

Recent analyses of the COMBINE (Combining Medications and Behavioral Interventions) Study (Anton et al., 2006) examined relationships between three drinking goals—controlled drinking (CD), CA, and TA—alcohol consumption outcomes (e.g., percentage of days abstinent [PDA], days to relapse to heavy drinking, DPDD), and global clinical outcome at the end of treatment (Bujarski et al., 2013). TA goals were associated with better drinking outcomes on PDA, days to heavy drinking relapse, and global clinical outcome. Those with CD goals had the worst outcomes on these measures. CD goals were associated with the fewest DPDD; those with CA goals had the most DPDD (Bujarski et al., 2013). Therefore, pretreatment drinking goal has been associated with multiple treatment outcomes. Patients who select CD goals drank less on drinking days than those who select TA goals. Patients who select TA goals, however, have the best time to relapse and overall rates of relapse outcomes. Dividing drinking goal into TA versus not revealed a similar pattern of results. Abstinence goals were associated with overall better outcomes across treatment, but no goal by treatment group interactions were found (Dunn and Strain, 2013).

Given the connections between pretreatment drinking goals and treatment outcomes, it is important to understand the factors, or individual characteristics, related to commitment to abstinence before treatment. Understanding the factors that guide goal selection could help clinicians better meet patients where they are and move forward with treatment in-step with the person's motivation and goal. Treatment can then better address the factors that influence goal selection, particularly if the goal needs to be changed later in treatment. Early work to understand the characteristics associated with goal selection generally found that CD was associated with higher levels of functioning. In a study of veterans receiving inpatient alcohol-dependence treatment, participants who selected abstinence goals had fewer years of education and more years of problem drinking than those with CD goals (Pachman et al., 1978). Comparing those who personally selected a CD or abstinence goal with those who were prescribed abstinence by a provider because of disease severity revealed similar results (Booth et al., 1984). Those who chose CD were younger and had fewer dependence symptoms. Participants who selected abstinence were more likely to attend follow-up care. Participants prescribed abstinence had the worst outcomes, including the most readmissions after treatment (Booth et al., 1984). Therefore, those with lower levels of physiological dependence and stronger beliefs in their ability to drink moderately may be better able to achieve positive outcomes with CD goals (Rosenberg, 1993).

One study found a slightly more complicated picture. Examination of the characteristics of male veterans admitted for inpatient alcohol dependence treatment revealed that those interested in CD had less family and vocational stability and a more serious drinking history (Cannon et al., 1977). Interestingly, initial goal is not always final goal. Hodgins and colleagues (1997) found that patients who were older, had more severe alcohol problems, and initially selected CD goals were more likely to change to abstinence-based goals during early treatment. Thus, even if people with more severe dependence initially select CD goals, they may be more likely to change to TA goals. Less research, however, has examined a broad range of factors that influence patients' selection of treatment goals.

The purpose of this study, therefore, was to examine an array of individual characteristics that might affect the choice of an alcohol treatment goal. We used the COMBINE data set, given the scope of patient characteristics assessed at baseline, to evaluate how three types of drinking goals (TA, CD, and CA) were associated with demographic indices, alcohol consumption and alcohol-related consequences, self-efficacy, and other complicating factors. Given that patients with more severe alcohol use and treatment histories are more likely to select TA goals, we hypothesized that being male and having a lower family income, higher levels of consumption, greater alcohol-related problems, and a history of treatment would be associated with TA goals. We hypothesized that greater drinking self-efficacy and lower levels of stress, indicating better psychosocial functioning, would be associated with CD and CA.

Method

The rationale, methodology, sample, and treatment outcomes of the COMBINE Study have been described extensively elsewhere (Anton et al., 2006; COMBINE Study Research Group, 2003a, 2003b). They are briefly summarized here.

Participants

Participants were recruited at 11 sites across the United States. The sample consisted of 1,383 participants (428 women, 955 men) who met the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (American Psychiatric Association, 1994), criteria for alcohol dependence. Mean age was 44.12 years (*SD* = 10.17). Of the 1,226 participants randomized into one of the eight medication arms of the study, 46 reported "other" treatment goals or indicated that they did not have a clear goal, and therefore we removed them from analysis. In addition, 18 participants had missing treatment goal data, and 6 had missing data on alcohol consumption; these participants were also removed. Therefore, 1,156 (799 men) participants were included in these analyses. Mean age was 44.44 years (*SD* = 10.23). The majority worked full time (*n* = 704, 61%), were single (*n* = 606, 52%), and were White (*n* = 893, 77%). A total of 454 (39%) participants selected a TA drinking goal, 300 (26%) selected a CD goal, and 402 (35%) selected a CA goal. Before treatment, they reported an average of 12.57 (*SD* = 8.00) DPDD, an average of 25.44% (*SD* = 25.20) days abstinent, and an average of 65.44% (*SD* = 28.62) heavy drinking days.

Measures

Drinking goal. Before treatment, the Thoughts About Abstinence Scale (Hall et al., 1990) assessed drinking goal. The item read, "We would like to know what GOAL you have chosen for yourself about using alcohol at this time." Participants were categorized into three groups: (a) CD, assessed by positive responses to any of the following items, "I want to use alcohol in a controlled manner—to be in control of how often I use and how much I use" and "I don't want using alcohol to be a habit for me anymore, but I would like to occasionally use alcohol when I really have an urge"; (b) TA goal, with a positive response to the item, "I want to quit using alcohol once and for all, to be totally abstinent, and never use alcohol ever again for the rest of my life"; and (c) CA, assessed by the items, "I want to be totally abstinent from all alcohol use for a period of time, after which I will make a new decision about whether or not I will use alcohol again in any way" and "I want to quit using alcohol once and for all, even though I realize I may slip up and use alcohol once in a while."

Demographics. Baseline questionnaires assessed gender, racial background, employment status, and family income. Race was dichotomized as White and non-White. Employment status was dichotomized as employed (full- or part-time employment) and not employed. Gross family income (in U.S. dollars) by all family members who live with the participant was coded as 1 = $0–$15,000, 2 = $15,001–$30,000, 3 = $30,001–$50,000, 4 = $50,001–$75,000, 5 = $75,001–$100,000, 6 = more than $100,000.

Alcohol consumption and alcohol-related consequences. The Form-90 (Miller and Del Boca, 1994; Tonigan et al., 1997) assessed pretreatment alcohol consumption. The Form-90 is a standardized 90-day retrospective interview about daily alcohol consumption. It combines Timeline Followback and grid averaging strategies to obtain accurate assessments of alcohol consumption. Two measures of alcohol consumption were used: average DPDD and PDA. The Alcohol Dependence Scale (ADS; Skinner and Allen, 1982) is a 25-item scale that assessed dependence symptoms, including withdrawal and increased tolerance, in the previous 12 months. Total scores range from 0 to 47. The Drinker Inventory of Consequences (DrInC; Miller et al., 1995) assessed negative consequences of alcohol use in the 90 days before treatment. The DrInC is a 50-item self-report measure that assesses consequences in five domains: interpersonal, physical, social, impulsive, and intrapersonal. Scales were combined to create a total score. The University of Rhode Island Change Assessment (URICA; DiClemente and Hughes, 1990) assessed participants' stages of readiness to change. The URICA is a 28-item scale that assesses the four stages of change: precontemplation, contemplation, action, and maintenance. It yields a single, continuous score.

Self-efficacy and prior treatment. Participants indicated on two single, dichotomous items whether they had ever participated in any other alcohol treatment and whether they had ever attended Alcoholics Anonymous (AA). The Obsessive Compulsive Drinking Scale (OCDS; Anton et al., 1995) assessed obsessive and compulsive craving and drinking behavior. The OCDS is a self-administered, 14-item scale to assess the obsessive and compulsive characteristics related to thoughts about drinking. Because the OCDS total scale score was highly correlated with all subscales (all *r*s > .70), only the total score was included in analyses. The Alcohol Abstinence Self-Efficacy Scale (AASE; DiClemente et al., 1994) assessed self-efficacy to abstain from drinking in situations that correspond to typical drinking cues. The types of situations include negative affect, social/positive, withdrawal, and urges. Total score for the social/positive scale was used for these analyses.

Complicating factors. Complicating factors were defined as constructs that are empirically demonstrated to negatively affect the course or outcome of alcoholism treatment but are not assessments of alcohol-specific behaviors (e.g., number of drinking days, abstinence motivation, consequences) or demographic characteristics. Thus, these are factors that should be considered in the course of clinical treatment planning. The Important People Interview (Longabaugh and Zywiak, 2002) assessed participants' social network composition. The Important People Interview is a structured interview that includes questions about participants' perceptions of people who are most important to them and with

whom they have had contact in the previous 4 months. Each participant can list up to 10 network members, specifying various aspects of each relationship including drinking status and frequency of network member drinking. Total number of in-network daily drinkers predicted worse alcohol treatment outcome and maintenance of treatment gains (Longabaugh et al., 2010) and was the measure used in these analyses.

The Form-90 (Miller and Del Boca, 1994; Tonigan et al., 1997) assessed smoking frequency with a single item asking participants how many days in the past 90 they smoked and how many cigarettes they smoked per day. Participants were dichotomized into smokers and non-smokers based on smoking frequency. Those who reported no smoking were coded as non-smokers; all others were coded as smokers. Physical Quality of Life was assessed with a single item from the Short-Form-12, Version 2 (Ware et al., 2002). The item assessed perceived physical health and was scored on a 1 (*poor*) to 5 (*excellent*) Likert scale. This item was selected because self-ratings of physical health have been related to mortality, even when modeled with other health indices (Idler and Benyamini, 1997; Jylhä, 2009). The Brief Symptom Inventory (BSI; Derogatis and Melisaratos, 1983) is a 53-item, self-report instrument that assesses nine psychological symptom dimensions, including somatization, depression, and anxiety in medical and psychiatric patients. The total global score indicates overall degree of distress and was used in our analyses. The Perceived Stress Scale–Short Form (PSS; Cohen, 1994) is a four-item instrument that assesses the degree to which participants perceive their lives to be controllable and predictable. Total scores were created by summing the items.

Alcoholism typology was determined on the basis of prior COMBINE analyses (Bogenschutz et al., 2009). Participants were categorized as either Type A or Type B based on composite variables derived from baseline assessments of (a) DPDD; (b) drinking for withdrawal relief; (c) alcohol-related medical conditions; (d) physical, social, and interpersonal drinking consequences; and (e) onset of alcoholism, family history risk, and comorbid psychopathology. Any history of mood disorder was dichotomized into yes/no, and use of other illicit substances was dichotomized into yes/no. Any history of arrest was also dichotomized into yes/no.

Data analytic plan

Predictor variables were divided into the following domains: demographics, alcohol use and consequences, self-efficacy and prior treatment, and complicating factors. Predictors were divided for both theoretical and statistical reasons. First, the domains represent known areas of clinical assessment for patients in alcoholism treatment, as providers collect demographic, alcohol use, and prior treatment history data. Complicating factors may or may not be assessed, depending on the circumstances of the individual patient. Thus, this division allows predictors to be grouped similarly to how patient information would be obtained and evaluated. Second, by grouping variables, we sought to minimize multicollinearity, which would mask significant relationships between predictors and treatment goal.

Within each domain, inferential statistics (i.e., analyses of variance, correlations, chi-squares) assessed whether there was a significant relationship between each predictor variable and treatment goal. Variables significantly related to treatment goal were used to build four multinomial logistic regression models to evaluate the effects of the significant variables within each domain on treatment goal. Model 1 included demographic variables: gender, race, employment status, and family wages. Model 2 included alcohol use and consequences variables: DPDD, PDA, ADS scores, URICA scores, and DrInC scores. Model 3 included self-efficacy and prior treatment variables: incidence of prior treatment, past AA involvement, alcohol-abstinence self-efficacy social, and OCDS total scores. Model 4 included complicating factors: alcohol typology, smoking status, number of daily drinkers in social network, PSS total, and BSI total. Because of the number of predictors being evaluated, potential interactions among predictors were, a priori, not considered. After these four domain-specific models were run, the significant predictors from all domains were added to a final model. Model 5 combined the statistically significant predictors from Models 1–4 in a final, non–domain-specific model of predictors of pretreatment drinking goals. In all models, pretreatment goal was coded as 1 = TA (reference category), 2 = CD, 3 = CA. All analyses were conducted in SPSS Statistics for Windows, Version 19.0 (IBM Corp., Armonk, NY).

Results

Descriptives

Table 1 contains descriptive information about potential predictors by pretreatment goal. Before any multinomial models were run, correlations assessed whether domain-specific predictors were significantly associated with treatment goal. In the demographics domain, gender, $\chi^2(2) = 12.62$, $p < .01$, ethnicity, $\chi^2(2) = 8.51$, $p < .05$, employment status, $\chi^2(4) = 18.18$, $p < .001$, and family wages, $F(2, 1146) = 29.88$, $p < .001$, all had significant relationships with pretreatment goal. Age was not significantly related, $F(2, 1155) = 2.26$, $p = .11$, and was not included in subsequent regressions.

In the alcohol use and consequences domain, DPDD, $F(2, 1153) = 45.54$, $p < .001$, PDA, $F(2, 1153) = 9.89$, $p < .001$, ADS score, $F(2, 1151)$, $p < .001$, DrInC total, $F(2, 1154) = 100.02$, $p < .001$, and URICA readiness score, $F(2, 1148) = 64.76$, $p < .001$, were associated with goal. Percentage of heavy days, $F(2, 1155) = 0.41$, $p = .66$, was not associated with goal. In the previous treatment/self-efficacy domain, history of any prior treatment, $\chi^2(2) = 89.15$, $p < .001$, and

Table 1. Pretreatment goal choice and descriptive baseline characteristics

Variable[a]	Total abstinence, (*n* = 454)	Controlled drinking, (*n* = 300)	Conditional abstinence, (*n* = 402)
Demographics			
Male, *n* (%)	319 (70%)	184 (61%)	296 (74%)
Married, *n* (%)	213 (47%)	156 (52%)	181 (45%)
White, *n* (%)	334 (74%)	248 (83%)	311 (77%)
Age, in years	44.62 (9.89)	45.24 (10.72)	43.63 (10.19)
Employed, *n* (%)	301 (66%)	235 (78%)	291 (72%)
Gross family income	3.36 (1.60)	4.21 (1.55)	3.44 (1.55)
Alcohol and consequences			
Drinks per drinking day	14.64 (9.08)	9.76 (5.96)	12.34 (7.34)
% Days abstinent	28.21 (26.43)	20.09 (23.59)	26.31 (24.38)
% Heavy drinking days	65.73 (28.85)	66.34 (29.19)	64.45 (27.85)
Consequences (DrInC)	56.19 (20.37)	36.29 (16.26)	47.57 (19.07)
ADS score	18.83 (7.58)	13.57 (5.94)	16.73 (7.05)
URICA score	11.17 (1.48)	9.96 (1.41)	10.49 (0.07)
Self-efficacy/prior treatment			
Prior treatment, *n* (%)	283 (62%)	83 (28%)	214 (53%)
Prior AA, *n* (%)	152 (34%)	16 (5%)	81 (20%)
OCDS score	28.54 (8.71)	24.57 (6.97)	26.52 (8.00)
AASE–social score	2.56 (1.05)	2.15 (0.82)	2.41 (0.90)
Complicating factors			
BSI score	61.43 (10.75)	57.96 (9.92)	61.09 (10.78)
PSS score	6.10 (2.84)	5.34 (2.82)	5.84 (2.96)
IPI–daily drinkers	0.51 (0.82)	0.69 (0.95)	0.62 (1.06)
Physical quality of life	2.78 (0.98)	2.46 (0.88)	2.81 (0.89)
Smoker, *n* (%)	264 (58%)	136 (46%)	232 (58%)
Mood disorder, *n* (%)	94 (21%)	67 (22%)	86 (21%)
Illicit substance use, *n* (%)	392 (86%)	267 (89%)	351 (87%)
Type A typology, *n* (%)	228 (50%)	212 (71%)	250 (62%)
Type B typology, *n* (%)	209 (46%)	80 (27%)	132 (33%)
Ever arrested, *n* (%)	25 (6%)	20 (7%)	25 (6%)

Notes: DrInC = Drinker Inventory of Consequences; ADS = Alcohol Dependence Scale; URICA = University of Rhode Island Change Assessment; AA = Alcoholics Anonymous; OCDS = Obsessive Compulsive Drinking Scale; AASE = Alcohol Abstinence Self-Efficacy Scale; BSI = Brief Symptom Inventory; PSS = Perceived Stress Scale; IPI = Important People Interview. [a]Unless otherwise noted, the unit of measurement is *M* (*SD*).

past AA attendance, $\chi^2(2) = 85.38$, $p < .001$, were both associated with goal. Within the same domain, the social situation confidence subscale of the Alcohol Abstinence Self-Efficacy Scale, $F(2, 1151) = 17.28$, $p < .001$, and all the scales of the OCDS questionnaire (all ps < .05), were associated with drinking goal.

In the complicating factors domain, alcohol typology, $\chi^2(4) = 36.47$, $p < .001$, smoking status, $\chi^2(2) = 13.97$, $p < .001$, daily drinkers in network, $F(2, 1153) = 3.35$, $p < .05$, PSS score, $F(2, 1140) = 6.31$, $p < .01$, quality of life, $F(2, 1131) = 14.20$, $p < .001$, and BSI score, $F(2, 1136) = 10.91$, $p < .001$, were significantly associated with drinking goal. Use of other illicit substances ($p = .56$), history of mood disorder ($p = .89$), and history of arrest ($p = .80$) were all unrelated.

Multinomial regressions

In Model 1, a four-predictor, multinomial logistic regression examined the relationship between pretreatment goal choice and demographic characteristics (Table 2). The model was significant, $\chi^2(8) = 77.09$, $p < .001$. When CD and TA were compared, women ($B = 0.41$, $p < .05$), those with higher family incomes ($B = 0.31$, $p < .001$), and those employed ($B = 0.37$, $p < .05$) were more likely to choose a CD goal. Race was unrelated to goal choice ($B = 0.22$, $p = .28$). When we compared CA goal with TA, none of the four predictors was related to goal choice.

In Model 2, a five-predictor regression examined the relationship between goal choice and the alcohol-domain predictors (Table 2). The model was significant, $\chi^2(10) = 289.76$, $p < .001$. When CD and TA were compared, those with fewer PDA ($B = -0.01$, $p < .01$), fewer DPDD ($B = -1.92$, $p < .001$), lower URICA scores ($B = -0.44$, $p < .001$), and lower DrInC scores ($B = -0.05$, $p < .001$) were more likely to select a CD goal versus a TA goal. ADS scores were unrelated ($p = .66$). Upon comparing CA with TA, we found that those with fewer DPDD ($B = -0.75$, $p < .05$), lower URICA scores ($B = -0.27$, $p < .001$), and lower DrInC scores ($B = -0.02$, $p < .001$) were more likely to select a CA goal versus a TA goal. PDA ($p = .83$) and ADS scores ($p = .79$) were unrelated.

Table 2. Multinomial logistic regression models for demographic, alcohol-related, prior treatment, and complicating factors domains predicting pretreatment drinking goal

	Total abstinence (reference) vs. controlled drinking goals			Total abstinence (reference) vs. conditional abstinence goals		
Predictor	*B* (*SE*)	OR [95% CI]	Wald χ^2	*B* (*SE*)	OR [95% CI]	Wald χ^2
Demographics						
Female	0.41 (0.16)	1.51 [1.10, 2.07]	6.41*	-0.17 (0.15)	0.85 [0.63, 1.15]	1.14
White	0.22 (0.20)	1.24 [0.84, 1.83]	1.18	0.19 (0.17)	1.21 [0.87, 1.67]	1.28
Employed	0.37 (0.18)	1.45 [1.02, 2.06]	4.20*	0.27 (0.16)	1.31 [0.97, 1.78]	3.04
Family wages	0.31 (0.05)	1.36 [1.23, 1.50]	34.50***	0.00 (0.05)	1.00 [0.92, 1.11]	0.00
Alcohol related						
PDA	-0.01 (0.00)	0.99 [0.98, 0.997]	7.79**	0.00 (0.00)	1.00 [0.99, 1.00]	0.05
DPDD	-1.92 (0.42)	0.15 [0.06, 0.33]	21.12***	-0.75 (0.34)	0.47 [0.24, 0.92]	4.81*
ADS score	0.00 (0.02)	1.00 [0.97, 1.04]	0.04	0.00 (0.02)	1.00 [0.98, 1.03]	0.07
DrInC score	-0.05 (0.01)	0.95 [0.94, 0.96]	56.44***	-0.02 (0.01)	0.98 [0.98, 0.99]	12.91***
URICA score	-0.44 (0.01)	0.96 [0.94, 0.97]	51.56***	-0.27 (0.05)	0.98 [0.98, 0.99]	28.95***
Prior treatment and self-efficacy						
AASE-social	-0.54 (0.10)	0.58 [0.48, 0.70]	32.33***	-0.18 (0.07)	0.84 [0.72, 0.97]	5.74*
OCDS-total	-0.06 (0.01)	0.94 [0.92, 0.96]	28.48***	-0.03 (0.01)	0.97 [0.95, 0.99]	10.47**
Prior treatment	1.08 (0.17)	2.94 [2.09, 4.12]	38.98***	0.18 (0.15)	1.19 [0.89, 1.59]	1.44
Attend AA	1.64 (0.29)	5.13 [2.93, 8.99]	32.64***	0.53 (0.17)	1.70 [1.23, 2.36]	10.17**
Complicating factors						
In network daily drinkers	0.28 (0.09)	1.32 [1.12, 1.56]	10.44**	0.17 (0.08)	1.19 [1.02, 1.40]	4.58*
PSS score	-0.02 (0.03)	0.98 [0.92, 1.05]	0.26	-0.03 (0.03)	0.98 [0.92, 1.03]	1.03
Smoking status[a]	0.38 (0.16)	1.47 [1.07, 2.02]	5.63*	-0.01 (0.15)	1.00 [0.74, 1.33]	0.00
BSI score	-0.02 (0.01)	0.98 [0.97, 1.00]	3.05	0.00 (0.01)	1.00 [0.98, 1.02]	0.00
Typology[b]	0.78 (0.17)	2.18 [1.56, 3.06]	20.54***	0.57 (0.15)	1.77 [1.32, 2.38]	14.34***
Physical quality of life	-0.26 (0.09)	0.78 [0.64, 0.93]	7.25**	0.08 (0.09)	1.09 [0.92, 1.29]	1.62

Notes: OR = odds ratio; CI = confidence interval; PDA = percentage of days abstinent; DPDD = drinks per drinking day; ADS = Alcohol Dependence Scale; DrInC = Drinker Inventory of Consequences; URICA = University of Rhode Island Change Assessment; CD-Social = Controlled Drinking–Social Scale; OCDS-Total = Obsessive Compulsive Drinking Scale; AA = Alcoholics Anonymous; PSS = Perceived Stress Scale; BSI = Brief Symptom Inventory. [a]Non-smoker was reference category; [b]Type A typology was reference category.
*$p < .05$; **$p < .01$; ***$p < .001$.

In Model 3, a four-predictor regression examined the relationship between pretreatment goal choice and the prior-treatment/self-efficacy domain (Table 2). The overall model was significant, $\chi^2(8) = 207.23$, $p < .001$. When CD goal and TA were compared, lower self-efficacy to abstain from social drinking ($B = -0.54$, $p < .001$), less craving ($B = -0.06$, $p < .001$), no prior treatment ($B = 1.08$, $p < .001$), and lack of past AA attendance ($B = 1.64$, $p < .001$) were associated with higher likelihood of having a CD goal. Upon comparing CA with TA, we found that lower self-efficacy to abstain from social drinking ($B = -0.18$, $p < .05$), less craving ($B = -0.03$, $p < .01$), and no past AA attendance ($B = 0.53$, $p < .01$) were associated with an increased likelihood of having a CA goal. History of prior treatment was not associated ($p = .23$).

In Model 4, a six-predictor regression examined the relationship between pretreatment goal choice and the complicating factors domain (Table 2). The model was significant, $\chi^2(12) = 82.84$, $p < .001$. When we compared CD goal with TA goal, those with more daily drinker relationships ($B = 0.28$, $p < .01$), Type A alcohol typology ($B = 0.78$, $p < .001$), lower physical quality-of-life scores ($B = -0.26$, $p < .01$), and non-smokers ($B = 0.38$, $p < .05$) were more likely to select a CD goal. PSS ($p = .61$) and BSI ($p = .08$) scores were not associated. When CA and TA goals were compared, those with more daily drinker relationships ($B = 0.17$, $p < .05$) and with Type A alcohol typology ($B = 0.57$, $p < .001$) were more likely to select a CA goal. BSI ($p = .99$), PSS ($p = .40$), and physical quality of life ($p = .32$) were not associated.

In Model 5, all significant predictors from the previous models were used to examine the relationship between pretreatment goal and all domains (Table 3). Predictors were entered into a backward, stepwise regression model. Predictors that had a significant chi-square likelihood ratio test remained in the model; those with non-significant tests were removed. The final model was significant, $\chi^2(30) = 377.12$, $p < .001$. Both the Pearson, $\chi^2(2092) = 2094.84$, $p = .48$, and Deviance, $\chi^2(2092) = 1929.25$, $p = 1.00$, tests of goodness of fit were non-significant, indicating that the final model fit the data well. Nagelkerke pseudo-R^2 was .34. When CD and TA were compared, those with lower DrInC scores ($B = -0.04$, $p < .001$), lower URICA scores ($B = -0.38$, $p < .001$), higher family income ($B = 0.17$, $p < .01$), no prior treatment experience ($B = 0.70$, $p < .001$), no AA attendance ($B = 1.11$, $p < .001$), lower self-efficacy to abstain from social drinking ($B = -0.46$, $p < .001$), and more daily drinkers in network ($B = 0.22$, $p < .05$) were more likely to choose a CD goal than a TA goal. When CA and TA were compared, those with lower DrInC scores ($B = -0.01$, $p < .01$), lower URICA scores ($B = -0.23$, $p < .001$),

Table 3. Final multinomial logistic regression model predicting pretreatment drinking goal

	Total abstinence (reference) vs. controlled drinking goals			Total abstinence (reference) vs. conditional abstinence goals		
Predictor	*B* (*SE*)	OR [95% CI]	Wald χ^2	*B* (*SE*)	OR [95% CI]	Wald χ^2
Female	0.35 (0.21)	1.42 [0.94, 2.13]	2.74	-0.18 (0.18)	0.84 [0.59, 1.19]	0.99
Family wages	0.17 (0.06)	1.19 [1.05, 1.34]	7.21**	-0.05 (0.05)	0.95 [0.86, 1.06]	0.79
Employed	-0.10 (0.23)	0.90 [0.58, 1.40]	0.21	0.04 (0.17)	1.04 [0.74, 1.46]	0.05
DPDD	-0.03 (0.02)	0.98 [0.99, 1.00]	2.57	-0.02 (0.01)	0.98 [0.96, 1.00]	2.28
PDA	-0.01 (0.00)	0.99 [0.99, 1.00]	2.19	0.00 (0.00)	1.00 [1.00, 1.01]	0.31
DrInC score	-0.04 (0.01)	0.96 [0.95, 0.97]	38.81***	-0.01 (0.01)	0.99 [0.98, 0.995]	8.83**
URICA score	-0.38 (0.07)	0.68 [0.60, 0.78]	31.83***	-0.23 (0.06)	0.79 [0.71, 0.88]	17.72***
AASE-social	-0.46 (0.11)	0.63 [0.51, 0.79]	17.27***	-0.10 (0.08)	0.90 [0.77, 1.06]	1.64
OCDS-total	0.00 (0.02)	1.00 [0.97, 1.03]	0.00	-0.01 (0.01)	0.99 [0.97, 1.01]	0.74
No prior treatment	0.70 (0.20)	2.01 [1.36, 2.97]	12.14***	0.12 (0.16)	1.12 [0.82, 1.55]	0.51
Never attend AA	1.11 (0.32)	3.03 [1.63, 5.61]	12.33***	0.31 (0.18)	1.36 [0.95, 1.94]	2.75
In-network daily drinkers	0.22 (0.10)	1.25 [1.03, 1.51]	4.96*	0.18 (0.09)	1.20 [1.01, 1.42]	4.47*
Smoking status[a]	-0.35 (0.20)	0.71 [0.48, 1.05]	3.01	-0.16 (0.16)	0.85 [0.62, 1.18]	0.94
Typology[b]	0.38 (0.20)	1.47 [0.99, 2.18]	3.56	0.31 (0.16)	1.37 [1.00, 1.87]	3.81
Physical quality of life	-0.06 (0.11)	0.95 [0.76, 1.17]	0.27	0.11 (0.09)	1.12 [0.94, 1.33]	1.60

Notes: OR = odds ratio; CI = confidence interval; DPDD = drinks per drinking day; PDA = percentage of days abstinent; DrInC = Drinker Inventory of Consequences; URICA = University of Rhode Island Change Assessment; CD-Social = Controlled Drinking–Social Scale; OCDS-Total = Obsessive Compulsive Drinking Scale; AA = Alcoholics Anonymous. [a]Non-smoker was reference category; [b]Type A typology was reference category.
*$p < .05$; **$p < .01$; ***$p < .001$.

and more daily drinkers in network ($B = 0.18$, $p < .05$) were more likely to choose a CA goal.

Discussion

This study examined the relationships between patients' pretreatment drinking goals and demographic characteristics, alcohol consumption and alcohol-related problems, self-efficacy and history of prior treatment, and other complicating factors assessed in the COMBINE study, to date the largest randomized, placebo-controlled, pharmacotherapy trial for alcoholism treatment. Participants had a variety of treatment goals. Although a large number selected TA (n = 454, 39%), the majority selected non-TA goals (n = 702, 61%), highlighting the need to understand the characteristics associated with each goal. Participants with higher levels of pretreatment functioning, as indicated by fewer alcohol-related consequences, lower readiness to change, and a lack of prior treatment, were more likely to select non-TA goals.

Consistent with our hypothesis, experiencing fewer alcohol-related consequences, lower readiness to change, higher family income, lack of prior treatment, and lack of AA experience were associated with an increased likelihood of selecting a CD compared with a TA goal. Similarly, experiencing fewer consequences and having lower readiness to change were associated with CA instead of TA. Inconsistent with our hypothesis was that pretreatment drinking was significantly associated with goal selection in the domain-specific model but not in the final, composite model. Overall, participants with a less severe baseline presentation were more likely to select a non-TA goal.

Previous research has highlighted that pretreatment drinking goals are related to treatment outcome (Bujarski et al., 2013) and that patients who are prescribed a treatment goal do worse than those allowed to select their goal (Booth et al., 1984). Combined with these findings, our results have clinical implications. Patients with non-TA goals may understand that their drinking is less severe and does not yet warrant total abstention from alcohol. Given that patients with CD goals report that they drink less when they drink after treatment (Bujarski et al., 2013), providers should be open to patients' selecting non-TA goals, particularly if they have less severe drinking histories. Despite the historical controversy about whether CD should be a treatment goal, given that some patients present to treatment with non-TA goals and that goal prescription is associated with worse outcomes, clinicians should carefully assess each patient's drinking goal and begin work toward that goal, assuming there are no medical contraindications to pursuing that goal. Understanding the individual characteristics associated with a patient's goal could help, in particular, to guide treatment in the future if a goal is not being met. In addition, the nature of the treatment goal could influence the selection of supportive pharmacotherapy. Naltrexone could help someone seeking moderation; disulfiram could provide a treatment adjunct to someone highly motivated for abstinence. Individuals with moderation goals may benefit more from cognitive–behavioral interventions, rather than a less intensive medical management approach (Bujarski et al., 2013); understanding the individual factors associated with the goal could guide cognitive interventions.

It is noteworthy that having more daily drinkers in the social network and lower social drinking self-efficacy were associated with an increased likelihood of selecting a non-TA goal. Despite a less severe baseline presentation, the significance of social drinking and network composition

should not be discounted. Using data from the Framingham Heart Study (Kannel et al., 1979), Rosenquist and colleagues (2010) found that a member is more likely to drink heavily if a directly connected network member drinks heavily. Similarly, members were more likely to abstain if a closely connected member also abstained (Rosenquist et al., 2010). These results mirror those from Project MATCH (Matching Alcoholism Treatments to Client Heterogeneity) and COMBINE. In Project MATCH, the percentage of abstainers/recovering alcoholic members and the daily network size were associated with better treatment prognosis (Zywiak et al., 2002). In COMBINE, alcohol-specific social support (i.e. heavy drinking close friends) predicted lower PDA (Longabaugh et al., 2010). For patients entering treatment with a less severe presentation but also a large number of daily drinkers in their social networks, a CD or CA goal may be more attractive than TA. The loss of these relationships could be particularly palpable and, given their lack of treatment history, could make non-TA goals a more palatable initial goal. If they are not successful in achieving moderation and become open to an abstinence goal, discussions about how to shift their network toward individuals who are not daily drinkers may be helpful.

The relationship between past treatment experience and choice of a TA goal is also noteworthy. Prior AA experience and prior treatment experience were associated with an increased likelihood of choosing TA compared with CD. There are a number of potential explanations. First, those with prior treatment experience have likely been introduced to abstinence as the only appropriate goal. As indicated, the majority of treatment programs espouse abstinence-based treatment. Alternatively, those who selected TA goals had more severe drinking patterns and more alcohol-related problems. In addition to having prior exposure to abstinence-based treatment, they could be more aware of their disease severity and have had failed past attempts at moderation. Given the general recommendation that patients with severe dependence or a medical condition that contraindicates alcohol consumption abstain from alcohol use (Marlatt and Witkiewitz, 2002), TA goals could be recognition that the severity of their alcohol dependence requires TA.

Finally, our results can be considered consistent with the World Health Organization's (2001) recommendation for the prevention and treatment of alcohol dependence. Alcohol problems should be viewed on a continuum; treatment should use an array of prevention alternatives targeted to specific populations (World Health Organization, 2001). Our results highlight that those with fewer alcohol-related problems are more likely to select less absolute goals. CD goals have been shown to be associated with fewer DPDD than either TA or CA goals (Bujarski et al., 2013). Therefore, for those without severe alcohol dependence, without high levels of associated alcohol-related problems and who are treatment naive, CD goals could be a better way to engage in treatment than requiring TA and may result in harm reduction.

There are limitations that should be considered. All assessments were self-reports. Although alcohol self-reports were obtained via reliable, gold-standard assessments, they could have been influenced by demand characteristics, despite collection before treatment. Biological data were not included and could be significant predictors of goal. These results should not be generalized to different treatment populations without replication. For example, different variables could predict the goal selections of young adults or older patients. Last, we did not have the ability to determine whether the goals represent a continuum or whether CA is a less-motivated version of TA. Future research could better investigate this.

In summary, our results provide the first large-scale analysis of the pretreatment factors that play a role in participants' selection of an alcohol treatment goal. Our findings indicate that participants with less severe drinking patterns, fewer alcohol-related problems, more daily drinkers in their social network, and no past experience with alcohol treatment or AA are more likely to select less absolute, moderation-based treatment goals than abstinence goals. Thus, for a subset of patients who present for alcohol dependence treatment, moderation-based drinking goals may be a better way to engage them in initial treatment planning. Acknowledging that these other goals are present, even if a program promotes abstinence, would be a good first step.

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